

Fig. BMT, Best medical therapy.

However, CEA, when performed, provides better protection against late CE compared with CAS. Further identification of clinical risk factors and plaque characteristics for CE will help improve efficiency of STB in stroke prevention and avoid unnecessary procedures.

Initial Experience with Intravascular Optical Coherence Tomography in Lower Extremity Arteries

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Objectives: Intravascular optical coherence tomography (OCT) uses near infrared light to provide rapid, high-resolution intraluminal axial images of vessel wall architecture. This technology requires the region-of-interest be clear of blood for satisfactory acquisition and has been used mostly in coronary vessels. The purpose of this study is to report our initial experience with OCT in lower extremity peripheral arteries. We compared the clearance quality between four different infusion media for optimizing imaging: 1) iodinated contrast, 2) dextran, 3) heparinized saline, and 4) carbon dioxide gas.

Methods: Patients undergoing elective lower extremity diagnostic angiography with possible endovascular intervention were enrolled in this study. All OCT images were acquired using an automated pullback for a 54-mm length of artery in approximately 2 seconds. Analysis for each

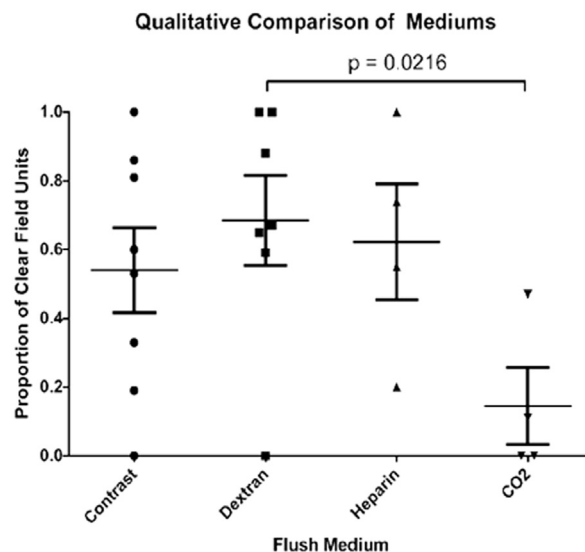


Fig 2.

pull-back included blood clearance grading by two independent reviewers with a third arbiter for disagreements. Adequate clearance was defined as a lack of signal attenuation for 270 degrees of each transverse slice throughout an axial sweep and categorically recorded as yes or no. Unpaired *t*-tests were used to compare image quality between each medium type.

Results: Ten patients underwent OCT imaging after initial contrast arteriography was obtained in either the external iliac, common femoral, or superficial femoral arteries depending on lesion distribution. The average age was 65 years, and 60% were female. OCT imaging allows 10 to 15 μ m resolution of the luminal border (Fig 1). The proportion of high fidelity images in each pullback for contrast, dextran, heparinized saline, and CO2 were 54% \pm 35%, 68% \pm 35%, 63% \pm 33%, and 15% \pm 22%, respectively (Fig 2). Dextran was significantly better in clearance quality than CO2 ($P = .02$). There were three catheter failures, but no procedural related complications occurred.

Conclusions: In this initial experience, OCT is feasible in large caliber peripheral vessels. Carbon dioxide does not provide adequate clearance for OCT imaging. Contrast, dextran, and heparinized saline are promising but need further investigation as clearance mediums for OCT.

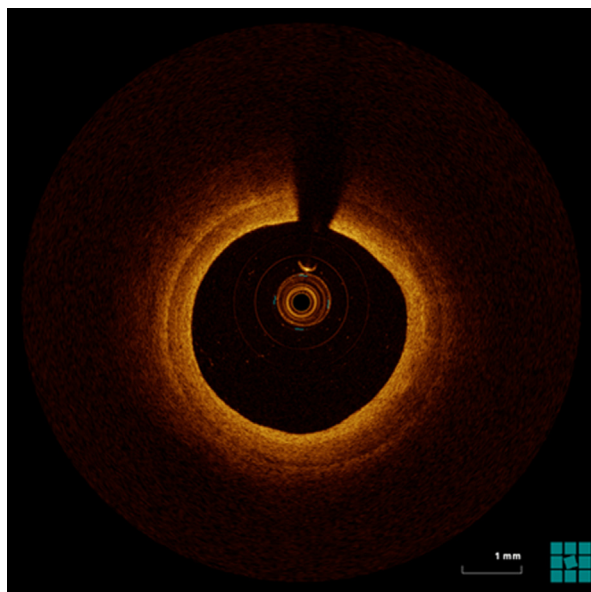


Fig 1.

Hemodynamic Changes in Patients Undergoing Carotid Endarterectomy Under Cervical Block and General Anesthesia

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Objectives: The objective of this study was to assess differences in hemodynamic stability for patients undergoing carotid endarterectomy (CEA) under general anesthesia (GA) as compared with cervical block anesthesia (CBA).

Methods: This is an Institutional Review Board-approved, multi-center, retrospective review of 651 patients from 1998 to 2012 undergoing CEA. A total of 254 patients undergoing CEA under CBA and 397 under GA were included. Comprehensive chart review including preoperative, postoperative, and 30-day follow-up was conducted. Hemodynamic monitoring was performed via intra-arterial catheterization of the radial artery in 98% of patients and via the brachial artery in 2%. Patients were monitored continuously intraoperatively and for 24 hours after surgery. All intraoperative vasoactive and antihypertensive medications administered were recorded.

Results: Both groups were similar in age, incidence of coronary artery disease, hypertension, and renal failure. There was a preponderance of female patients, incidence of chronic obstructive pulmonary disease, diabetes mellitus and nicotine abuse in the GA group. Evaluation of hemodynamic stability under GA vs CBA revealed that under GA patients had far more hemodynamic fluctuations, with an average of three or more fluctuations in mean arterial pressure greater than 20% ($P < .001$; Fig). Under GA, 51% of patients required vasopressors alone vs 36% under CBA ($P < .0002$). Antihypertensive medications alone were required in 63% of patients in the

GA group vs 73% in the CBA group ($P = .0085$). Thirty percent of all patients required both vasopressors and antihypertensives during surgery; 23% (CBA) vs 34% (GA; $P = .0457$). There were no postoperative complications or mortality in the CBA cohort. The GA cohort developed postoperative complications (myocardial infarctions, 4; stroke, 6; hematoma, 9); however, these complications were not statistically significant compared with the CBA group.

Conclusions: For patients undergoing CEA, CBA resulted in less hemodynamic fluctuations and fewer vasoactive medication requirements as compared with GA.

Number of Times the change in mean BP > 20 %, per patient

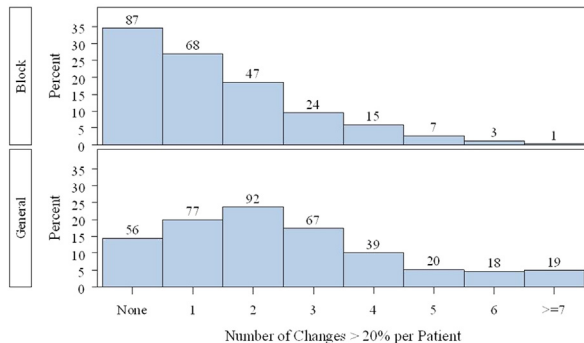


Fig. BP, Blood pressure

Endovascular Repair of Popliteal Artery Aneurysm: A Comparison of Outcomes with Contemporary Open Surgical Repair

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Objectives: To compare outcomes after endovascular repair (ER) and open surgical repair (OR) of popliteal artery aneurysms (PAAs).

Methods: Clinical data of PAA patients treated between 2005 and 2012 were reviewed. Primary endpoints were major adverse events (MAE) including mortality, thrombosis, amputation, complications, and reinterventions.

Results: A total of 46 limbs of 38 patients (37 males; mean age, 81 ± 6.4 years) were treated with ER, electively ($n = 34$) or emergently ($n = 12$). A mean of 2.0 Viabahn stent grafts were used. Thirty-day mortality and amputation was 0 after elective ER and 17% (2/12) after emergencies. Thirty-day patency was 100% after elective ER and 75% (3/12) after emergencies. MAE was 8.8% after elective and 58% after emergency ER ($P = .0007$). Mean follow-up was 2.3 years (range, 1 month to 6.0 years). Three-year primary and secondary patencies were 72% and 82% for electives and 60% and 83% for emergencies ($P > .05$), freedoms from reintervention were equivalent (69% vs 55%), and limb salvage and freedom from MAE rates were higher for electives than for emergencies (100% vs 83% and 63% vs 30%; $P < .05$). One hundred ten limbs of 91 patients (90 males; mean age, 71 ± 9.8 years) were treated with OR, electively ($n = 98$) or emergently ($n = 12$). Autogenous veins ($n = 89$) or PTFE ($n = 21$) were used as bypass grafts. Thirty-day amputation rate was 0, one patient died (1%), and one graft (1%) thrombosed after elective OR. Thirty-day MAE was 7.1% after elective and 33% after emergency OR ($P = .02$). Mean follow-up was 3.4 years (range, 1 month to 8.0 years). Three-year primary and secondary patencies were 82% and 90% for electives, 83% and 92% for emergencies ($P > .05$), limb salvage rates were similar (99% vs 100%), and freedoms from reintervention and freedom from MAE rates were higher for electives than for emergencies (85% vs 67% and 77% vs 58%; $P < .05$). ER and OR in elective interventions had similar patencies and MAE; hospitalization was longer after OR. Emergency repair prolonged intensive care unit stay after ER but hospital days, patencies, and MAE were similar. Factors affecting MAE included ER and emergency repair.

Conclusions: PAAs with ER and emergency repair continue to have elevated MAEs. Both elective ER and OR have excellent early results and similar late outcome. Selective use of ER in patients who need emergency repair is clearly warranted.

The Effect of Extremity Vascular Complications on the Outcomes of Cardiac Support Device Recipients

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Objectives: To assess the effect of extremity vascular complications (EVC; including ischemia and vessel trauma) on the outcomes of patients receiving cardiac support devices (CSD; including ventricular assist device [VAD] and extracorporeal membrane oxygenation [ECMO]).

Methods: Institutional review board-approved, retrospective review of a prospectively maintained database of all temporary and permanent CSD recipients from 7/1/10 to 6/30/12. Patient demographics, procedural data, and outcomes were analyzed. The primary endpoint was all-cause mortality at 30 days post-CSD initiation.

Results: Of 208 patients who received CSDs, 31 (14.9%) experienced EVC: 13 (8.9%) of the 146 permanent VADs, 10 (26.3%) of the 38 temporary VADs, and eight (33.3%) of the 24 ECMO patients. The 30-day mortality was significantly higher for temporary VAD patients who experienced EVC versus those that did not (80.0% vs 35.7%; $P = .03$). However, 30-day mortality was not significantly impacted by EVC in the permanent VAD (15.4% EVC vs 4.5% without EVC; $P = .15$) and ECMO patients (50.0% vs 68.75%; $P = 1.00$). Preinitiation peripheral arterial disease and cardiogenic shock did not significantly differ between the CSD groups. Outcomes for CSD subgroups following the occurrence of EVC are shown in Table.

Table. Outcomes for 31 cardiac support device (CSD) recipients who experienced extremity vascular complications (EVC)

	Permanent VAD	Temporary VAD	ECMO
CSD recipients experiencing EVC	13	10	8
Outcomes			
Any vascular procedure, n (%)	7 (53.9%)	9 (90.0%)	6 (75.0%)
Revascularization, n (%)	5 (38.5%)	4 (40.0%)	2 (25.0%)
Amputation, n (%)	0 (0.0%)	1 (10.0%)	1 (12.5%)
Withdrawal of care, n (%)	3 (23.1%)	8 (80.0%)	4 (50.0%)
Time to death after EVC, days (\pm SEM)	60.14 ± 21.48	15.38 ± 2.34	15.20 ± 7.21
30-day mortality after EVC, n (%)	2 (15.4%)	8 (80.0%)	4 (50.0%)

ECMO, Extracorporeal membrane oxygenation; SEM, standard error of the mean; VAD, ventricular assist device.

Conclusions: In temporary VAD recipients, the development of extremity vascular complications results in higher 30-day mortality and more frequent withdrawal of care. In contrast, extremity vascular complications in the permanent VAD and ECMO groups did not significantly impact mortality or withdrawal of care. This prognostic data may be useful in the management of these challenging patients.

Altered Sca-1+ Progenitor Cell Populations in Diabetic Mice Are Associated with Increased Neointimal Hyperplasia After Vascular Injury

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Objectives: Diabetic patients exhibit poor outcomes after vascular interventions, predominantly due to development of neointimal hyperplasia. While diabetic mice have been shown to have diminished Sca-1+ stem cells in their bone marrow, the role of Sca-1+ cells in the vasculature is unknown. We hypothesize that diabetic mice have diminished Sca-1+ stem cell populations in the arterial wall compared with wild type (WT) mice. We also hypothesize that vascular injury will alter the presence and distribution of Sca-1+ cells in the arterial wall.

Methods: The femoral artery wire injury model was performed in 8- to 12-week-old male Lepr *db/db* diabetic and C57BL/6 WT mice. Treatment groups included control and injury. Femoral arteries were harvested at 24 hours and 3 days and assessed for Sca-1+ cells with immunofluorescence ($n = 5$). Sca-1+ staining was graded on a scale of 0 to 4 in four